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A REVISION OF *DIASTELLA* (PROTEACEAE)

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Abstract

A revision of *Diastella* has been undertaken; 7 species are recognized. A key to the species is provided and distribution maps for each species are given. *Diastella* is upheld as a distinct genus, separated from *Leucospermum* on sound morphological characters. It is postulated that *Diastella* could have evolved from some of the small flowered species of *Leucospermum* such as are placed in *Leucospermum* Sect. *Diastelloidea*.

Uittreksel

'N HERSIENING VAN *DIASTELLA* (PROTEACEAE)

Die geslag *Diastella* is hersien en 7 soorte erken. 'n Sleutel tot die soorte en verspreidingskaarte vir elke soort word aangebied. Die duidelike onderskeidende morfologiese kenmerke van *Diastella* skei dit van *Leucospermum*. Daar word gepostuleer dat *Diastella* uit die *Leucospermum* soorte met klein blommetjies soos die in *Leucospermum* Seksie *Diastelloidea* kon ontwikkel het.

Introduction

Diastella, comprising 7 species, is a genus of small, almost herbaceous shrubs, endemic to the south-western Cape. By the close of the 18th century, most of the known species had been described, usually under the generic names of *Protea* or *Leucadendron*. Later, in 1809, R. A. Salisbury, writing in Joseph Knight's *On the cultivation of the plants belonging to the natural order Proteēae*, founded *Diastella*, while at the same time publishing a remarkably accurate revision of the genus. Brown (1810), however, did not recognize *Diastella* as construed by Salisbury. Instead, he expanded the concept of *Mimetes* Salisb. and divided it into 2 sections with the species placed by Salisbury in *Diastella*, being accommodated in *Mimetes* Salisb. sec. II *Mimetes spuriae* R.Br. This unnatural and awkward arrangement gave rise to untold confusion on the part of subsequent authors who ignored Salisbury (1809) but struggled desperately to justify the association of two very different morphological lines under one generic name. A detailed investigation of the problem by Phillips (1911) led to the reinstatement of *Diastella* Salisb. and the publication of a complete revision of the genus in 1912. The present revision has been undertaken in order that it might be used in the account of the Proteaceae being prepared for the *Flora of Southern Africa*.

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GENERIC DEFINITION

Although members of the genus *Diastella* have a distinctive overall appearance, a clear, unambiguous definition is difficult to make, largely on account of the inclusion of *D. myrtifolia and D. parilis*. The majority of the *Diastella* species are easily characterized as they lack hypogynous scales, they have only terminal inflorescences (capitula), entire leaves, equal perianth segments, and the perianth tube is either absent or so short as to be barely perceptible. *D. myrtifolia* and *D. parilis* differ in that both these species have hypogynous scales, occasionally dentate leaves, inflorescences which are produced in both terminal and axillary positions, subequal perianth segments with the abaxial perianth segment being larger and longer than the 3 adaxial perianth segments and a perianth tube up to 2 mm long. These characters suggest an affinity with *Leucospermum* although the overall appearance of both *D. myrtifolia* and *D. parilis* is clearly similar to that of the other species of *Diastella*.

However, there is one morphological feature common to all species of *Diastella* as defined here: the *floral bracts are linear to filiform, hyaline and uniformly pubescent*. In addition, the involucre surrounding the inflorescence is usually 1–3 seriate and is composed of loosely arranged bracts, foliaceous to papyraceous in texture (often almost hyaline) and which exceed or equal the length of the perianth. A combination of the characters mentioned in this paragraph is considered to be the most reliable circumscription of *Diastella*.

In conclusion, it is perhaps worth noting that, after undertaking palynological studies on the genus, Erdtman (1966: 344) concluded that ''Pollen morphology supports generical rank of *Diastella*''.

EVOLUTIONARY SPECULATIONS

Variation patterns in two species, *D. divaricata* and *D. thymelaeoides* point to the continuing divergence of morphologically distinguishable geographical races (Figs. 5 and 7). Such patterns suggest that active speciation is still taking place in *Diastella*.

The case of *D. divaricata* is of particular interest since it may be used in an attempt to gauge the rate of speciation within the genus. Distribution and variation patterns are here interpreted in relation to recent palaeogeographic research (Dingle and Rogers, 1972a; Dingle and Rogers, 1972b).

Lower sea-levels during the Pleistocene would have resulted in the exposure of much of the Agulhas Bank and adjacent coastal areas. According to Dingle and Rogers (1972a), this lowering of the sea-level would have varied from – 50 m at 11 000 – 9 000 years before present, to – 140 m at 20 000 years before present. A regression of this magnitude would have permitted the ancestral stock of a species like *D. divaricata* to be continuously dispersed over an area extending from the Cape Peninsula to the Hottentots Holland Mountains, during the period 11 000 to 20 000 years before present. The marine transgression which followed after about

10 000 years before present, would have resulted in the flooding of False Bay and the accumulation of the unconsolidated dunes of the Cape Flats. It would also have effectively isolated two segments of the ancestral population of *D. divaricata*. Under conditions of isolation one may postulate that these two populations diverged and differentiated into two very distinct geographical subspecies (Fig. 5), and that this differentiation took place during the past 10 000 years.

RELATIONSHIP WITH OTHER GENERA

In a diagram indicating what they consider to be the most likely phylogenetic relationships in the Proteaceae, Johnson and Briggs (1975) show *Leucospermum* and *Diastella* on separate but almost parallel lines. However, it seems that *Leucospermum* and *Diastella* are even more closely related, as evidenced not only by their morphology but also by the occurrence of a natural, putative, bigeneric hybrid between them. (See HYBRIDS.)

As mentioned previously, two intermediate species, *D. myrtifolia* and *D. parilis* appear to link *Leucospermum* and *Diastella*. It is possible to derive *Diastella* from a hypothetical ancestor, which is most likely to have been a *Leucospermum* of the section *Diastelloidea*, by postulating a reduction series with *D. myrtifolia* and *D. parilis* occupying a transitional position. In such a hypothetical scheme, it is probable that the following changes have taken place in the development of *Diastella* from *Leucospermum:*

(1) A change from axillary to terminal capitula.
(2) A decrease in perianth size.
(3) A reduction in the asymmetry of the perianth to the stage where the 4 perianth segments are free and equally developed.
(4) The progressive reduction in the perianth tube until the 4 perianth segments are free to the base.
(5) A reduction in the number of teeth at the leaf apex to the stage where entire leaves predominate.
(6) A reduction in the woodiness of the plant from a fairly woody shrub with a clearly defined flowering period in *Leucospermum* to a very much less woody almost herbaceous shrublet in *Diastella* in which flowering takes place almost continuously throughout the year.

Finally, a consideration of the distribution pattern of *Diastella* shows that the genus is restricted to a rather small part of the south-western Cape – very different from the wide range of *Leucospermum*. With the exception of the monotypic *Orothamnus, Diastella* has the smallest distribution range of all the genera of African Proteaceae. (Fig. 1.)

Bearing in mind the foregoing remarks on the morphological affinities of *Diastella* with *Leucospermum* and also its restricted distribution range, the author considers it plausible to suggest that *Diastella* may well have evolved relatively recently (by comparison with related Proteaceous genera) and that the most likely ancestral stock from which it could have been derived is *Leucospermum* sect. *Diastelloidea*.

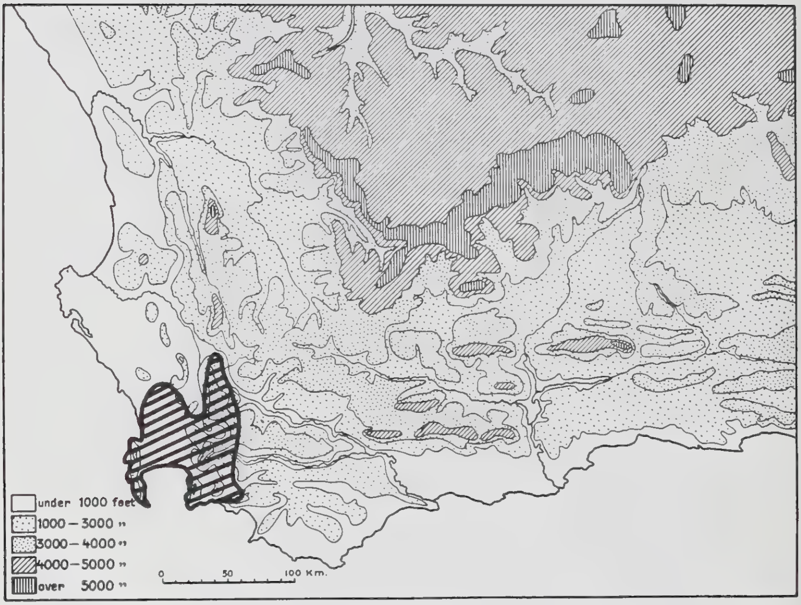


FIG. 1.
Distribution of the genus *Diastella* Salisb.

A REVISION OF DIASTELLA

Diastella Salisb. in Knight, Cult. Prot.: 61 (1809); Phill. in J. Bot. Lond. **49:** 28 (1911); Phill. & Hutch. in Fl. Cap. **5:** 650 (1912); Hutch., Gen. of Fl. Pl. **2:** 289 (1967).

Mimetes Salisb. sect. II *Mimetes spuriae* R. Br. in Trans. Linn. Soc. Lond. **10:** 109 (1810).

Mimetes Salisb. sect. *Pseudomimetes* Endl., Gen. Pl. Suppl. **4** (2): 78 (1848); Meisn. in DC., Prodr. **14:** 264 (1856).

Lectotype: D. thymelaeoides (Berg.) Rourke – syn. *D. bryiflora* Salisb. ex Knight. (See Hutch., Gen. of Fl. Pl. **2:** 289 (1967).

DERIVATION OF NAME

From the Greek, *diastellein*, to put asunder, separate or expand. The name apparently alludes to the deeply divided perianth segments which are free to the base or almost free to the base, resulting in a very short, almost imperceptible perianth tube, or no perianth tube at all.

Small shrubs, erect, sprawling or decumbent; with slender stems. *Leaves* subimbricate to imbricate, oblong, orbicular, lanceolate-elliptic or acicular-terete, usually entire, occasionally with 2 or 3 apical teeth, puberulous to glabrous. *Inflorescences* globose, globuliform or broadly campanulate, 1–2 cm in diam., sessile; usually solitary and terminal, occasionally axillary and clustered. *Involucral bractis* 1–3 seriate, equalling or exceeding the length of the perianth; ovate, lanceolate, acute to acuminate, foliaceous to papyraceous in texture, often hyaline. *Involucral receptacle* flat to slightly convex, 1–2 mm in diam. *Floral bracts* linear to filiform, hyaline, uniformly pubescent on abaxial surface. *Perianth* 6–10 mm long, straight in bud, regular except in 2 species in which the abaxial perianth segment is slightly longer than the remaining three; limbs filiform to lanceolate-linear, acute to acuminate, glabrous or sericeous; claws filiform, sericeous, tube absent, scarcely perceptible or rarely up to 2 mm long. *Anthers* linear, acute, inserted at base of perianth limb. *Style* terete, filiform, 8–12 mm long; glabrous or pubescent proximally; curved before anthesis, elongating and straightening later. *Pollen presenter* cylindric, filiform, scarcely differentiated from the style. *Ovary* ovoid 1 mm long, pubescent, with a solitary ovule. *Hypogynous scales* usually absent, present only in 2 species. *Fruit* an ovoid to cylindric achene, emarginate at base, glabrous to puberulous, greyish-white.

DIAGNOSTIC CHARACTERS

Diastella may be distinguished by having small globose to globuliform, terminal (rarely axillary) capitula, 1–2 cm in diam. with the perianth 6–10 mm long, with a 1–3 seriate involucre of somewhat loosely arranged foliaceous to papyraceous often hyaline bracts, equalling or exceeding the length of the perianth and with *linear to filiform floral bracts, uniformly sericeous.*

DISTRIBUTION

Seven species, endemic to the extreme south-western corner of the south-western Cape Province.

KEY TO THE SPECIES OF DIASTELLA

Hypogynous scales present
    Involucral bracts broadly ovate, prominent, drying brown and papyraceous .... (1) **parilis**
    Involucral bracts oblong-elliptic, green and foliaceous, not very prominent .... (2) **myrtifolia**
Hypogynous scales absent
    Leaves acicular
        Outer surface of involucral bracts covered with a soft sericeous indumentum; stems of the current year's growth pubescent, leaves 5–15 mm long .... (6) **proteoides**
        Outer surface of outer whorl of involucral bracts glabrous (margins ciliate); stems of current year's growth glabrous, leaves 10–25 mm long, overtopping the inflorescence .... (7) **buekii**

Leaves orbicular, oval, elliptic or lanceolate
  Perianth pink ....(3) **divaricata**
  Perianth creamy-white
    Leaves 1–4 mm wide ....(4) **fraterna**
    Leaves 4–9 mm wide ....(5) **thymelaeoides**

(1) **Diastella parilis** Salisb. ex Knight, Cult. Prot.: 62 (1809); Phill. & Hutch. in Fl. Cap. **5:** 653 (1912). Type: "By the river, Roode Zand Cascade", *Niven 44* (K!)

Mimetes myrtifolia R.Br. vars a & b R.Br. in Trans. Linn. Soc. Lond. **10:** 110 (1810); Roem. & Schultes, Syst. Veg. **3:** 385 (1818); Meisn. in DC., Prodr. **14:** 265 (1856). Types: (of vars. a & b): Africa australis, Prom. bon spei, without collectors (BM!)

A low, erect, rounded shrub, 50–70 cm in height, with a single main stem. *Stems* pubescent, 1–2 mm in diam. *Leaves* oblong – elliptic 1–3 cm long, 2–5 mm wide, slightly twisted at base, apex acute and entire or obtuse to truncate with 2–3 apical teeth; softly velutinous. *Inflorescences* sessile 1,5–2 cm in diam., depressed globose, solitary and terminal or axillary with 2–6 inflorescences clustered towards the apex of a flowering shoot. *Involucre* prominent, 3 seriate. *Involucral bracts* broadly to very broadly ovate, 7–8 mm long, 4–5 mm wide, apices acute or blunt with a point; brown and papyraceous on drying, outer surface glabrous, margins ciliate. *Involucral receptacle* flat, 3 mm in diam. *Floral bracts* linear – filiform, densely sericeous. *Perianth* pink, 8–10 mm long, densely sericeous; tube 2 mm long, glabrous proximally, becoming sericeous distally; the abaxial perianth segment slightly longer than the remaining 3; limbs lanceolate – acute, glabrous at base but crinite at apex, abaxial limb sericeous and larger than the remaining 3. *Style* 10 mm long, straight, glabrous. *Pollen presenter* linear – acute, 1 mm long. *Hypogynous scales* 3 mm long, acuminate. *Ovary* ellipsoid, sericeous, 1 mm long.

DIAGNOSTIC CHARACTERS

This species may be distinguished from its congeners by its very broadly ovate involucral bracts, glabrous (apart from the ciliate margins) on the outer surface and becoming brown and papyraceous on drying.

Diastella parilis occurs in the upper Breede River Valley where it appears to be confined to a relatively narrow zone along the foothills of the surrounding mountains, at elevations varying from 250 to 500 m on sandy soils derived from Table Mountain sandstone. Seepage areas, which are moist in winter, are the usual habitat. Its range extends from the vicinity of the Tulbagh waterfall southwards to Wolseley and Slanghoek. Flowering takes place over a six-month period, from July to January, during which time the pink inflorescences are produced.

Specimens Examined

CAPE—3319 (Worcester): Ceres road (-AC), Nov., *Schlechter 9085* (PRE, PH, BOL, GRA, L, BM, K); Romans River, Sept., *Compton 11658* (NBG, BOL); Between Niewekloof and Elandskloof, Jan., *Drège s.n.* (SAM, BM, S, G, L, K): Roode Sand cascade, *Niven 44* (K); Roode Sand, Oct., *Roxburgh 39* (K); Darling Bridge (-CA), Sept., *Esterhuysen 6091* (BOL, NBG, PRE, K); Slanghoek, July, *Walters 258* (NBG); Breede River, July, *Walters 149* (NBG); Slanghoek at Goudini (-CB), 7.1.1829, *Drège s.n.* (P); Goudini Sand flats, 6.1.1829 *Drège 1972* (P); on the farm Witelsrivier, Slanghoek valley, July, *Rourke 1483* (NBG, PRE, STE, MO).

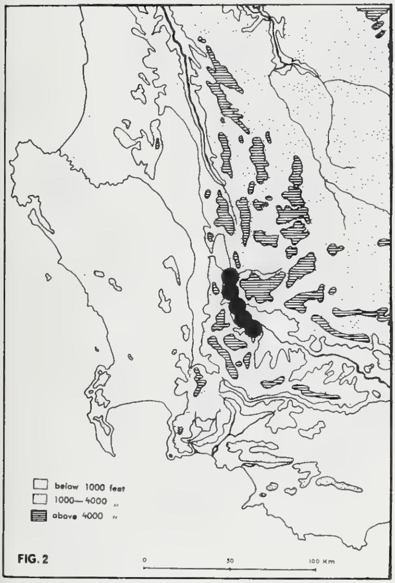


FIG. 2

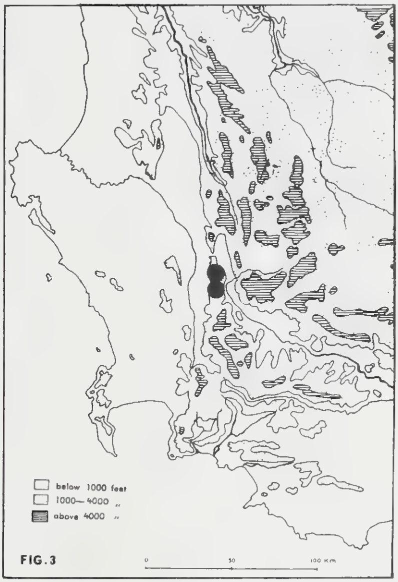


FIG. 3

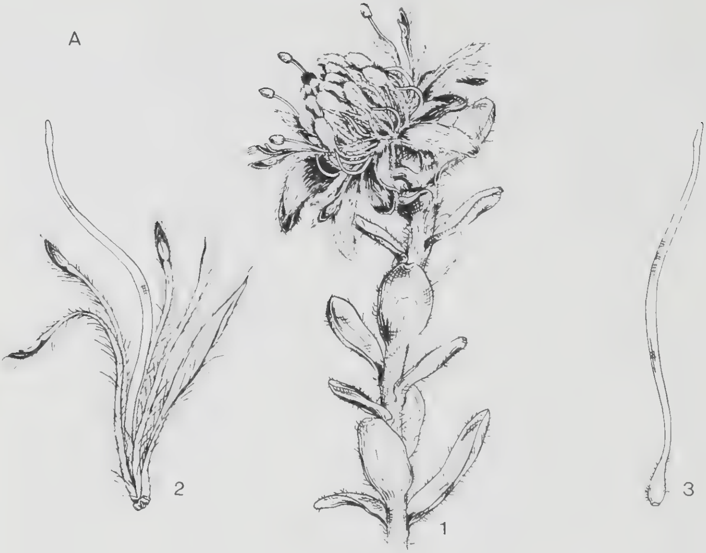
Fig. 2.
Distribution of *Diastella parilis* Salisb. ex Knight.

Fig. 3.
Distribution of *Diastella myrtifolia* (Thunb.) Salisb. ex Knight.

(2) **Diastella myrtifolia** (Thunb.) Salisb. ex Knight, Cult. Prot.: 63 (1809); Phill. & Hutch. in Fl. Cap. **5:** 653 (1912).

Protea myrtifolia Thunb., Diss. Prot.: 41 (1718); Fl. Cap., ed. Schultes: 37 (1823). Type: C.B.S., sheet no. *2942* in herb. Thunberg. (UPS!).

Protea dichotoma Lam., Tabl. Encycl. **1:** 235 (1792). Type: C.B.S. in herb. Lamarck (P – LA!)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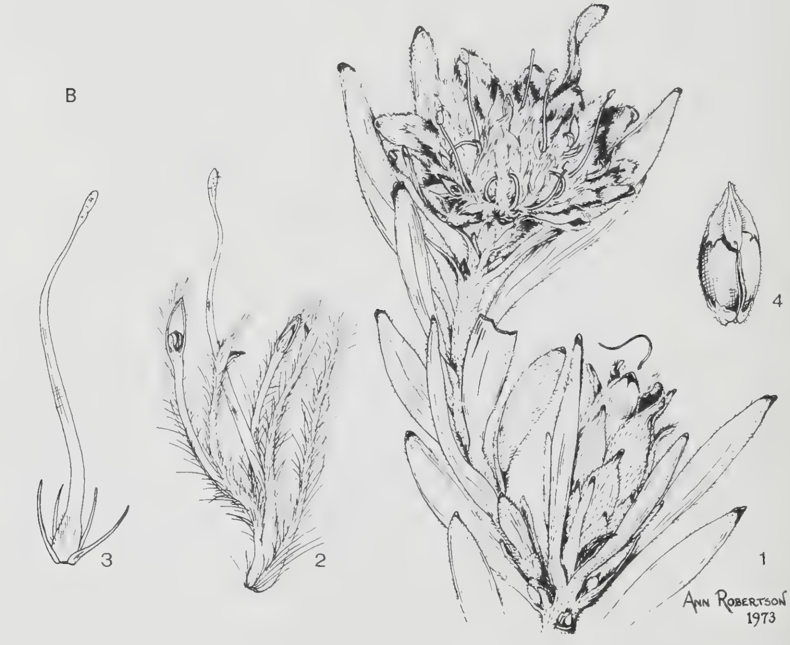
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An erect to suberect, densely branched shrub, the lower branches somewhat sprawling; 0,5 – 1 m in height, up to 2 m in diam. *Stems* puberulous, 2 mm in diam. *Leaves* oblong to narrowly elliptic, 1–2,5 cm long, 0,2–0,6 cm wide, usually entire with a single apical callous, occasionally with 2–3 teeth; softly puberulous, becoming glabrescent with age. *Inflorescences* terminal or axillary, usually solitary, but occasionally with up to 3 inflorescences per flowering shoot; broadly campanulate, 1,5 cm in diam. *Involucral bracts* oblong, 5–10 mm long, 1–3 mm wide, foliaceous, sparsely sericeous, margins ciliate, apex obtuse; forming a biseriate, campanulate involucre. *Floral bracts* erect, linear acute, 8–10 mm long, 1 mm wide, densely sericeous. *Perianth* straight 6–8 mm long, the abaxial segment elongating at anthesis, claws sericeous, limbs glabrescent but crinite at apex; tube 2 mm long, glabrescent proximally. *Style* straight or slightly curved, 8 mm long, tapering subterminally. *Pollen presenter* linear, obtuse, 0,5 mm long. *Ovary* ovoid, puberulous, 1 mm long. *Hypogynous scales* linear, subulate. *Fruits* grey, ovoid, 5–6 mm long, 3 mm wide, minutely puberulous.

DIAGNOSTIC CHARACTERS

The presence of hypogynous scales at once characterizes this species which is further distinguished by its oblong-elliptic foliaceous involucral bracts and sprawling, mat-like growth habit.

D. myrtifolia has an exceptionally small area of distribution. Its range extends from the valley around the Tulbagh waterfall in the Kluitjieskraal Forest Reserve, southwards to the Suurvlakte, a distance of about 8 km. Small scattered populations are usually found on sandy soils, particularly on moist seepage areas, near streamsides or in similar damp, sheltered situations, at elevations of from 425 to 600 m. The pink inflorescences are produced mainly from September to January.

SPECIMENS EXAMINED

CAPE—3319 (Worcester): Hills above Tulbagh waterfall (-AC), 29.8.1971, *Esterhuysen 32624* (NBG); Tulbagh waterfall valley, 17.1.1894, *Guthrie 3117* (NBG); valley above the Tulbagh waterfall, 25.10.1973, *Rourke 1400* (NBG); at waterfall, Roodezand, Nov. 1799, *Roxburgh 49* (K), by the river and elsewhere in moist places, Roodezand, Oct., *Niven 36* (G, PH); Roodezand, Oct., *Roxburgh 32* (G); Kluitjieskraal Forest Reserve, Zuurvlakte, Nov., *Haynes 219* (STE).

(3) **Diastella divaricata** (Berg.) Rourke, comb. nov.

Leucadendron divaricatum Berg. in Kongl. Vetensk. Acad. Handl. **27:** 322 (1766) – basionym. Type: "e Cap. sp. *Grubb*" *s.n.* in herb. Bergius (SBT!)

FIG. 4.

(A) *Diastella divaricata* (Berg.) Rourke ssp. *divaricata*; (1) flowering shoot × 2,5; (2) open flower × 6; (3) gynoecium × 6 (from *Rourke* 1490)

(B) *Diastella myrtifolia* (Thunb.) Salisb. ex Knight; (1) flowering shoot × 2,5; (2) open flower × 6; (3) gynoecium – with hypogynous scales × 6; (4) fruit × 3 (from *Rourke* 1400).

Protea divaricata (Berg.) L., Mant. Alt.: 194 (1771); Thunb., Diss. Prot. 44,58 (1781).

Mimetes divaricata (Berg.) R.Br. in Trans. Linn. Soc. Lond. **10:** 111 (1810); Roem. & Schultes, Syst. Veg. **3:** 383 (1818); Meisn. in DC., Prodr. **14:** 265 (1856).

Diastella serpyllifolia Salisb. ex Knight in Knight, Cult. Prot.: 62 (1809); Phill. & Hutch. in Fl. Cap. **5:** 652 (1912); Adamson & Salter; Fl. Cap. Penins.: 326 (1950) – nom. supfl. Type: As for *Leucadendron divaricatum* Berg.

Diastella vacciniifolia Salisb. ex Knight in Knight, Cult. Prot.: 63 (1809). Type: Specimen labelled "French Hoek Kloof, *Niven 45*" in Salisbury's hand (K!).

Mimetes parviflora Klotzsch in Krauss, in Flora **28:** 77 (1845). Type: In arenosis prope Uitershoek (Cap.), Sept. 1838, *Krauss s.n.* (isotype NBG, ex Akad. Hohenheim!).

Mimetes intermedia Buek ex Meisn., in DC, Prodr **14:** 265 (1856). Syntype: Africa australis, *Gueinzius s.n.* in herb. Meisner (NY!) N.B. No other syntypes were traced in herb. Meisner.

A low sprawling shrub with a single main stem, forming a tangled mat to 50 cm in height, 1–3 m in diam. *Stems* often trailing, 1–3 mm in diam., pubescent, much branched. *Leaves* ascending or secund to subsecund, oval, ovate, rounded or narrowly lanceolate to lanceolate – elliptic, 2,5–17,5 mm long, 1,5–6,5 mm wide, sparsely villous at first becoming glabrescent to glabrous. *Inflorescences* terminal, globose, 1–1,5 cm in diam. *Involucral receptacle* flat to slightly convex, 1–2 mm in diam. *Involucre* 2 seriate, the same length as the perianth. *Involucral bracts* 5–9 mm long, 1,5–2,5 mm wide, pink at base, greenish towards apex, outer surface sparsely sericeous, margins ciliate. *Floral bracts* 5–8 mm long, filiform, sericeous, pale pink to hyaline. *Perianth* 6–8 mm long, straight, claw and limbs filiform, sericeous; anthers sessile. *Style* straight, filiform, tapering terminally 8–10 mm long, sparsely sericeous on the lower half or less; stigmatic groove terminal. *Ovary* ovoid 1 mm long, sericeous.

REGIONAL VARIATION

From the mass of herbarium material assigned to *Diastella divaricata* it appears possible to detect two forms on the basis of leaf morphology: those with oval, ovate or round leaves and those with narrowly lanceolate to lanceolate-elliptic leaves. In order to make a more objective analysis of the situation, measurements of the leaf dimensions from 30 specimens of each form were plotted as a scatter diagram (Fig. 5).

Two broad groupings, based on leaf length, emerge. Moreover, these groupings can be correlated with leaf morphology and geographical distribution. While no absolutely clear-cut distinction on leaf length is possible, it is clear that the shorter leaf lengths are associated with the round to oval leaved form which is confined to the Cape Peninsula. Longer leaves are associated with the narrowly lanceolate to

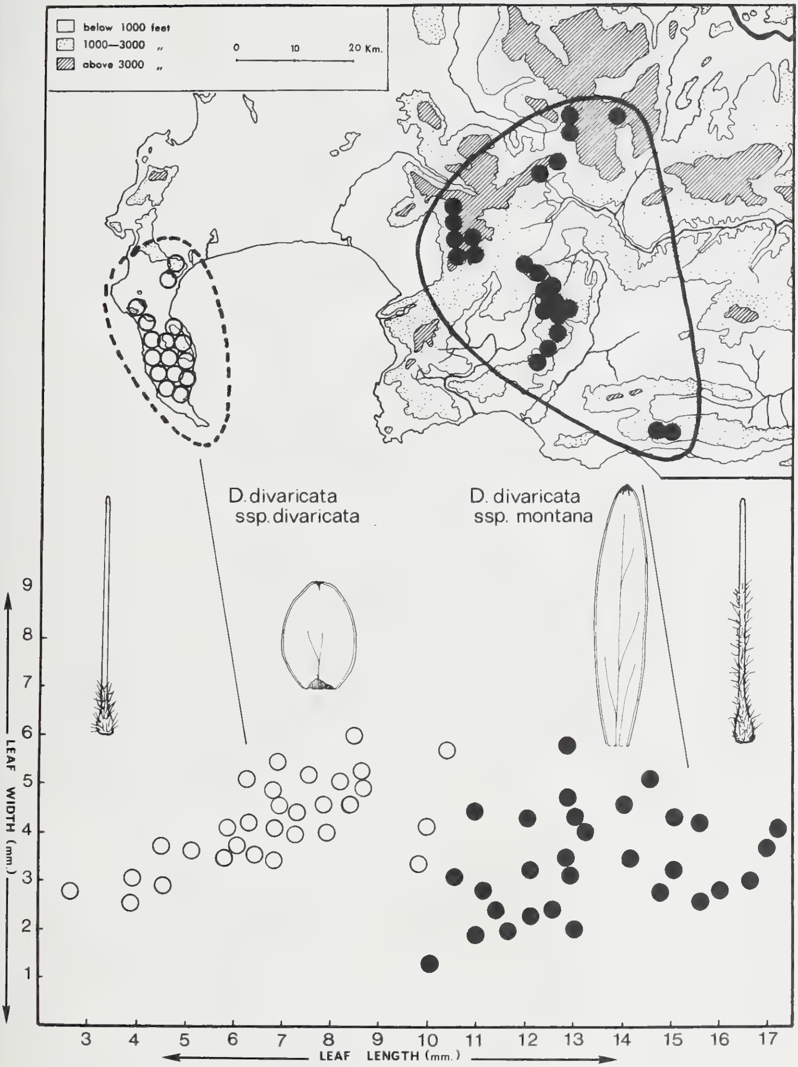

FIG. 5.
Diastella divaricata (Berg.) Rourke, showing distribution and variation. Style pubescence and variation in the leaf dimensions of *D. divaricata* ssp. *divaricata* are shown on the left (open circles) while style pubescence and variation in the leaf dimensions of *D. divaricata* ssp. *montana* Rourke are shown on the right (solid circles).

lanceolate-elliptic leaved forms, found in all populations of *D. divaricata* other than those on the Cape Peninsula.

In addition, slight differences in the extent of the pubescence at the base of the style was observed. This too, could be correlated geographically. In populations on the Cape Peninsula, pubescence occurs on the style for a distance of 1–2 mm above the ovary, while in all populations off the Cape Peninsula, pubescence occurs over 5–6 mm of the style above the ovary; that is, on the lower half of the style.

Thus there are slight but constant morphological differences between the two geographical races of *D. divaricata*. Accordingly, they are here treated as subspecies.

KEY TO THE SUBSPECIES

Leaves oval, ovate or rounded, 2,5–10 mm long; style sparsely pubescent for 1–2 mm above ovary; confined to Cape Peninsula. . . . . ssp. **divaricata**

Leaves narrowly lanceolate to lanceolate-elliptic, 10–17,5 mm long; style sparsely pubescent for 5–6 mm above ovary; confined to the Wemmershoek, French Hoek, Hottentots Holland and Houwhoek mountains. . . . . .ssp. **montana**

ssp. **divaricata**

A low, sprawling shrublet with a densely tangled branch system forming mats to 3 mm in diam. *Leaves* oval, ovate or rounded, 2,5–10 mm long, 2,5–6 mm wide. *Style* sparsely pubescent 1–2 mm above ovary.

DISTRIBUTION

The distribution range of *D. divaricata* ssp. *divaricata* extends over the southern half of the Cape Peninsula from the Steenberg Plateau southwards to Cape Point. It is most abundant at low elevations on the flats although a few populations do occur at elevations of up to 600 m. The small pink inflorescences are produced throughout the year

SPECIMENS EXAMINED

CAPE—3418 (Simonstown): Upper reaches of Bokram stream, Kommetjie, (-AB), Sept., *Rourke 1490* (NBG); mountain slopes, Fish Hoek, Jan., *Allsopp 41* (PRE); Klawer Valley, Jan., *Wolley Dod 300* (BOL, BM, K); Schuster's Bay, Aug., *Barker 819* (NBG, PRE); Red Hill, above Simonstown, *Boss 348* (PRE, STE); in mountains near Simonstown, Feb., *Schlechter 312* (PRE, BM, K, PH); Kalk Bay, Aug., *Thode 9287* (STE); Muizenberg, near Steenberg Peak, Aug., *Stauffer & Esterhuysen 5042* (PRE, STE); Simons Bay, Oct., *R. Brown s.n.* (BM); Smiths Farm, Buffels Bay (-AD), Oct., *Hutchinson 655* (PRE, BOL, K); Olifantsbos, Jan., *Mauve 4247* (PRE, K); Smitswinkel Vlei, June, *Morris 97* (NBG); sandy places at Uitershoek, Sept., *Krauss s.n.* (NBG); near Cape Point, Oct., *Godman 859* (BM); Cape Point Nature Reserve, Jan., *Rodin 3303* (PRE, K).

ssp. **montana** Rourke, ssp. nov.

Fruticulus ramosus laxus, teges diffusa formans, 1–2 m in diam. *Folia* lanceolata-elliptica, 10–17,5 mm longa, 1,5–6 mm lata, apices acuti. *Stylus* pilosus sparsus 5–6 mm supra ovarium.

A laxly branched, sprawling shrub forming diffuse mats, 1–2 m in diam. *Leaves* narrowly lanceolate to lanceolate-elliptic, 10–17,5 mm long, 1,5–6 mm wide; apices acute. *Style* sparsely pubescent 5–6 mm above ovary.

Type Material: Highlands Forest Reserve, midway between Highlands Forest Station and Houwhoek Pass, 21.11.1973, *Rourke 1408* (NBG, holo.; PRE, STE, MO, K, S, iso.)

Distribution

As its subspecific epithet indicates, *D. divaricata* ssp. *montana* favours montane habitats, generally at elevations ranging from 300 to 1 200 m. The small, rather scattered populations are usually found in cool, moist, south-east facing situations. Its entire area of distribution, from the Wemmershoek mountains to the French Hoek, Hottentots Holland, Houwhoek and Klein River mountains, falls within a zone that receives light summer precipitation from the cloud banks caused by south-easterly winds, in addition to the usual winter rainfall. Like the typical subspecies, flowering takes place throughout the year.

Specimens Examined

CAPE—3319 (Worcester): Franschhoek Reserve, Purgatory Outspan (-CC), May, *Stehle 156* (STE); Wemmershoek mts, Oct., *Wasserfall 487* (NBG); Louwshoek Peak, west slopes (-CD), Dec., *Esterhuysen 11172* (BOL).

—3418 (Simonstown): Vlakte east of Landdrost Kop (-BB), Dec., *Esterhuysen 3552* (BOL, PRE); on the path between Landdrost Kop and Somerset Sneeuwkop, March, *Rourke 1318* (NBG); eastern slopes of Landdrost Kop, June, *Thorne s.n.* (SAM *51549*).

—3419 (Caledon): Highlands Forest Reserve, midway between Highlands Forest Station and Houwhoek Pass (-AA), Nov., *Rourke 1408* (NBG); Lebanon, at met. station, Jan., *Verdoucq 89* (STE, PRE); Houwhoek Forest Reserve, Aug., *Hubbard 453* (PRE, STE); in montibus Houwhoek, *Zeyher 3694* (STE, PRE, SAM); Houwhoek, Oct., *Galpin 4477* (PRE); Lebanon, Nov., *Kruger 182* (PRE); Houwhoek Forest Reserve, Sept., *Rourke 1108* (NBG); Nuweberg Forest Reserve, Aug., *Rourke 828* (NBG); Viljoen's Pass, Dec., *Strey 2917* (PRE); Honingklip, Bot River (-AC), Nov., *L. E. Taylor 4848* (NBG); Paardeberg, Kleinmond, Nov., *Willems 73* (NBG); on the Highlands road, western boundary of Honingklip, July, *Rourke 1191* (NBG); Klein River mountains between Hermanus and Stanford (-AD), Sept., *Stokoe s.n.* (BOL *16891*).

(4) **Diastella fraterna** Rourke, sp. nov. *D. divaricata* ssp. *montana* affinis, sed habito suberecto, perianthio lacteo, differt.

Fruticulus parvus, ad 70 cm altus, suberectus. *Folia* ascendentia vel patentia vel subimbricata, anguste lanceolata-elliptica vel ob lanceolata, 8–14 mm longa, 1–4 mm lata, prope basin torta; sparsim pubescentia vel glabra. *Inflorescentiae* obconicae-depressae, 1–15 cm in diam., planescentia. *Bracteae involucrales* 2 seriatae, lanceolatae-ellipticae, obtusae vel acutae, puberulae vel glabrae, 6–10 mm longae, 1–3 mm latae, papyrescentes brunneae; margines ciliatae. *Receptaculum* 2 mm in diam. *Perianthium* 8–10 mm longum, rectum, lacteum, sericeum. *Stylus* rectus, 12–14 mm longus, sparsim sericeous basaliter. *Ovarium* ovoideum, sericeum, 1 mm longum.

A low shrublet to 70 cm in height, up to 1 m in diam., with a single main stem; erect, or suberect to straggling. *Stems* 1–3 mm in diam., pubescent to glabrous. *Leaves* ascending to patent, occasionally subimbricate; narrowly lanceolate-elliptic to oblanceolate, 8–14 mm long, 1–4 mm wide, occasionally slightly twisted at base; apex acute to obtuse; sparsely sericeous to glabrous. *Inflorescences* obconic – depressed, 1–1,5 cm in diam., becoming flattened on opening. *Involucral bracts* 2 seriate; lanceolate-elliptic, 6–10 mm long, 1–3 mm wide, obtuse, or acute, minutely pubescent to glabrous, drying to brown and becoming papyraceous. *Receptacle* 2 mm in diam., slightly convex. *Floral bracts* linear, sericeous, 1 cm long. *Perianth* 8–10 mm long, white, sericeous; claws linear, limbs acuminate. *Style* straight, 12–14 mm long, very sparsely sericeous in the lower half, tapering terminally. *Anthers* sessile, narrowly lanceolate. *Ovary* 1 mm long, ovoid, sericeous.

Type Material: Paardeberg, above Kleinmond, 19.11.1967, *J. P. Rourke 982* (NBG, holo.; PRE, STE, K, MO, iso.)

DIAGNOSTIC CHARACTERS

This species is closely allied to *D. divaricata* ssp. *montana* but may be distinguished from that species by its suberect to erect growth habit and the creamy-white colour of the styles and perianths. Although their distribution ranges are almost contiguous no hybridization appears to take place between the two taxa. In some populations of *D. fraterna* the involucral bracts are particularly distinctive, becoming brown and papyraceous with age.

D. fraterna is confined to the lower Palmiet River valley, ranging from Aries Kraal southwards to the mouth of Palmiet River. Populations occur in a variety of habitats, from sea-level to 450 m. It appears to be equally at home on stony, well-drained slopes and also moist sites such as seepage areas or along streamsides. Flowering takes place intermittently throughout the year.

SPECIMENS EXAMINED

CAPE—3318 (Simonstown): Between Somersfontein and Aries Kraal, below Kogelberg, (-BB), Jan., *Rourke 1179* (NBG); Palmiet River mountains, lower slopes of Platberg (-BD), April, *Andreae 877* (PRE, STE); Oudebos, Aug., *van* *der Merwe 1229* (STE, PRE); Palmiet River mouth, March, *Vogts 10* (PRE, STE); Bobbejaanberg, March, *van der Merwe 920* (PRE); stony hills along Palmiet River, April, *Esterhuysen 31527*; Hangklip, Sept., *Compton 13558* (NBG); Palmiet River mouth, Dec., *Compton 12821* (NBG).

—3419 (Caledon): Paardeberg, seaward side (-AC), Dec., *Grobler 017* (STE, PRE); 1 km east of Heuningklip, Kleinmond mountains, May, *de Vos 1372* (PRE); road to Kogelberg Reserve from Highlands, Oct., *Williams 532* (BOL); mountains above Kleinmond, Dec., *Rourke 28* (BOL); between Aries Kraal and the Louws River drift, Kogelberg Reserve, Dec., *Rourke 1003* (NBG); Paardeberg, above Kleinmond, Nov., *Rourke 982* (NBG); below "The Crags", Kleinmond, July, *Rourke 785* (NBG); Highlands, Nov., *Compton 12271* (NBG).

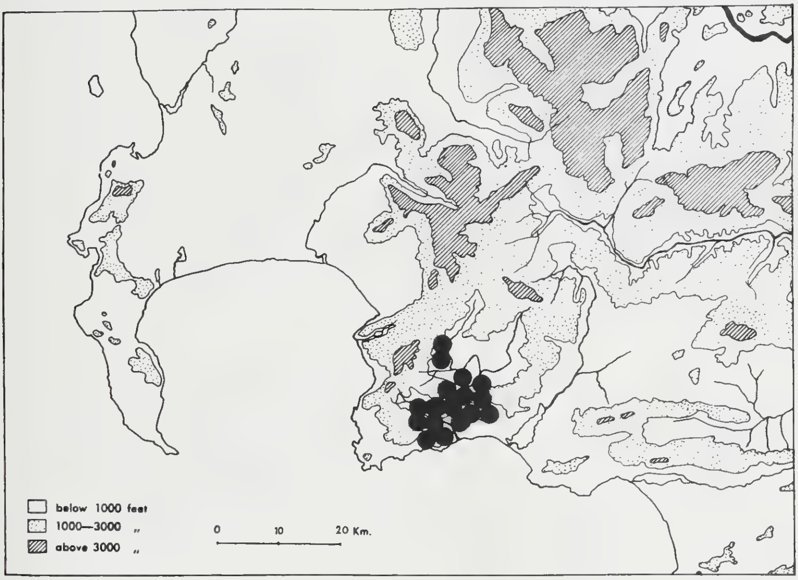

FIG. 6.
Distribution of *Diastella fraterna* Rourke.

(5) **Diastella thymelaeoides** (Berg.) Rourke, comb. nov.

Leucadendron thymelaeoides Berg. in Kongl. Vetensk. Acad. Handl. **27:** 324 (1766); Berg., Descript. Plant. Cap.; 19 (1767) – basionym. Type: "e Cap. b spei.", *Grubb s.n.* in herb. Bergius (SBT!).

Mimetes thymelaeoides (Berg.) R.Br. in Trans. Linn. Soc. Lond. **10:** 109 (1810); Roem. & Schult., Syst. Veg. **3:** 382 (1818); Meisn in DC., Prodr. **14:** 265 (1856).

Protea thymelaeoides (Berg.) Poir. in Lam., Encycl. Meth. Bot. Suppl. **4:** 568 (1816).

Protea concava Lam., Tab. Encycl. Meth. Bot. **1:** 234 (1792). Type: Cape of Good Hope, without collector, in herb. Lamarck (P-LA!)

Paranomus concavus (Lam.) O. Kuntze, Rev. Gen. Pl. **2:** 580 (1891); Levyns in Contrib. Bol. Herb. **2:** 39 (1970).

Diastella bryiflora Salisb. ex Knight in Knight, Cult. Prot.: 62 (1809); Phill. & Hutch. in Fl. Cap. **5:** 651 (1912) – nom. supfl. type: As for *Leucadendron thymelaeoides* Berg.

Protea villosa Jacq. ex Meisn. in DC., Prodr. **14:** 265 (1856) – as to specimen in herb. Willd. – nom. nud.

An erect to suberect shrub, 0,5–1,5 m in height, with a single main stem. *Stems* 2 mm in diam., densely puberulous, later glabrous. *Leaves* narrowly to broadly oval or broadly elliptic, subimbricate, ascending, entire, with a single apical thickening, puberulous, becoming glabrous, 8–22 mm long, 4–9 mm wide. *Inflorescences* terminal, sessile, globuliform 1–2 cm in diam. *Involucral bracts* 3 seriate, oblong-obtuse, narrowly lanceolate to lanceolate acute, 6–20 cm long, 1–3 mm wide, brown on drying, softly velutinous becoming glabrous later, margins ciliate. *Perianth* 7–10 mm long, straight, densely sericeous but glabrous proximally, creamy-white. Perianth segments free to base. *Floral bracts* linear, 8 mm long, densely sericeous. *Style* sparsely sericeous in the lower half, 10–12 mm long, tapering subterminally. *Pollen presenter* filiform-acute, 0,5 mm long. *Ovary* ovoid, 1 mm long, densely sericeous.

Variation

On inspecting all available herbarium material of *D. thymelaeoides*, slight differences in the leaf morphology were evident. It seemed possible to distinguish two groups, one having essentially oval leaves, the other having elliptic leaves. Detailed field studies throughout the distribution area of the species established that specimens of *D. thymelaeoides* having oval leaves tended to occur at the northern end of its distribution range, while collections with elliptic leaves were concentrated at the southern limits of its range. Leaf measurements were made and plotted as a scatter diagram (Fig. 7) in order to examine this apparent trend more objectively.

This revealed that two geographically isolated races of *D. thymelaeoides* are distinguishable: a northern race, centred around the Steenbras catchment area, having short oval leaves, and at the southern end of its range from Rooi Els to Hangklip, a longer-leaved race, having elliptic leaves. While a clear geographical gap, albeit only a small one of about 9 km, exists between these two races, the discontinuity between them that emerges after plotting their leaf dimensions is sufficiently clear to warrant recognition of these two races at the rank of subspecies.

KEY TO THE SUBSPECIES

Leaves oval or rounded, 8–14 mm long ....ssp. **thymelaeoides**

Leaves elliptic, 12–22 mm long ....ssp. **meridiana**

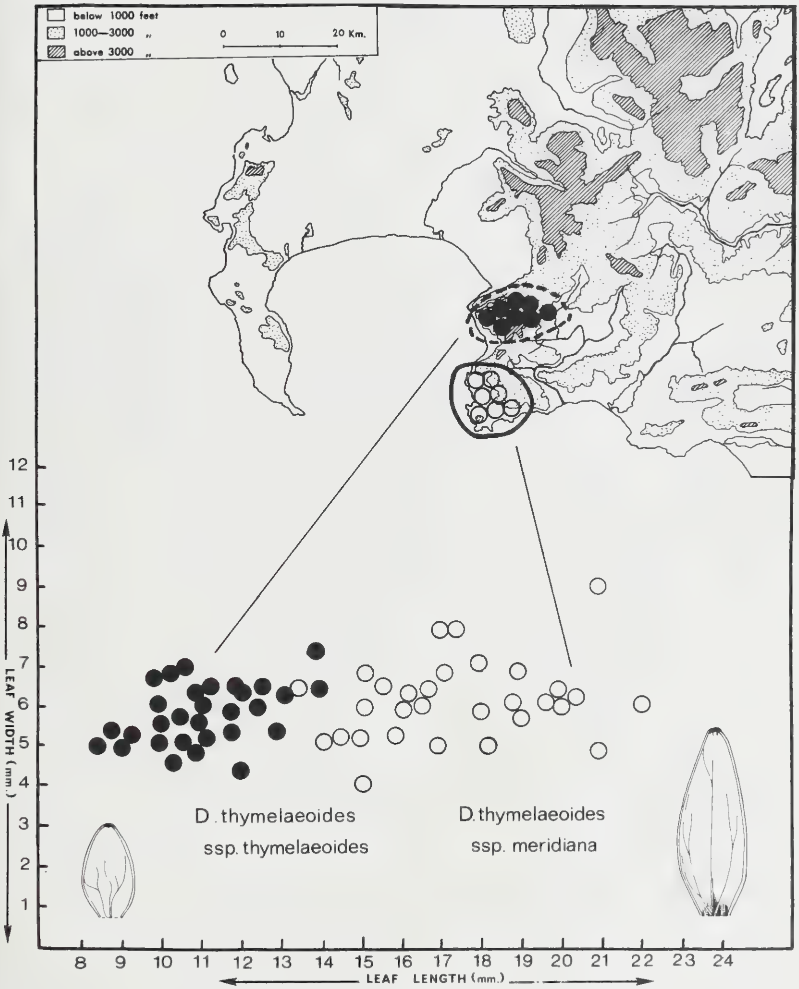

FIG. 7.

Diastella thymelaeoides (Berg.) Rourke, showing distribution and variation in the leaf dimensions of *D. thymelaeoides* ssp. *thymelaeoides* (solid circles) and *D. thymelaeoides* ssp. *meridiana* Rourke (open circles).

ssp. **thymelaeoides**

An erect shrub to 1,5 m in height. *Leaves* oval or rounded, 8–14 mm long. *Inflorescence* 1–1,5 cm in diam. *Involucral bracts* short, tending to clasp the base of the inflorescence, not prominently stellately patent.

DISTRIBUTION

The typical subspecies occurs chiefly in the Steenbras River catchment area and on the adjacent mountain ranges, at elevations ranging from 450–900 m. Flowering takes place throughout the year but reaches a peak from August to November.

SPECIMENS EXAMINED

CAPE—3418 (Simonstown): Kogelberg (-BB), Aug., *Stokoe 8377* (BOL); near Steenbras Reservoir, Feb., *Salter 5212* (BOL, K, NBG); top of Steenbras valley, Jan., *Galpin 12702* (PRE, K); Steenbras River mountains, Oct., *Andreae 1149* (PRE); Gordon's Bay, Feb., *Markötter s.n.* (STE *8763*); Kogelberg, north-west side, Feb., *Rourke 326* (NBG); sandy flats east of Steenbras Reservoir, Aug., *Rourke 823* (NBG); at the head of Boskloof, Steenbras, Aug., *Rourke 821* (NBG); near Steenbras dam, July, *A. B. Rendle 185* (BM); Grabouw, vlei ground, Dec., *Britten 3125* (PRE): Aries Kraal, Palmiet River valley, Nov., *Lewis 913* (SAM): Aries Kraal, Nov., *Barker 3334* (NBG).

ssp. **meridiana** Rourke ssp. nov.

Frutex suberectus, 0,5–1 m altus. *Folia* elliptica, 12–22 mm longa. *Inflorescentia* globuliformis 2 cm in diam. *Bracteae involucrales* patentes, manifeste stellatae.

A suberect shrub, 0,5–1,0 m in height. *Leaves* elliptic 12–22 mm long. *Inflorescence* globuliform, 2 cm in diam. *Involucral bracts* patent, prominently stellate.

Type Material: Lower north-east foothills of Blesberg, Cape Hangklip 29.6.1975, *J. P. Rourke 1482* (NBG, holo; PRE, STE, K, MO, S, M, iso.)

DISTRIBUTION

D. thymelaeoides ssp. *meridiana* ranges from Rooi Els southwards to Cape Hangklip and Betty's Bay. Unlike the typical subspecies which occupies a montane habitat, the ssp. *meridiana* is mainly confined to habitats at lower elevations, from sea-level to 150 m. Flowering takes place throughout the year, but mainly from August to November.

SPECIMENS EXAMINED

CAPE—3418 (Simonstown): West base of hill between Pringle Bay and Hangklip (-BD), *Pillans 8228* (K, BOL); Rooi Els, Nov., *Compton 17526* (NBG, BOL, PRE); Pringle East Peak, Sept., *Esterhuysen 18861* (BOL); Hangklip point, Jan., *Rodin 3130* (PRE); Hangklip, north slopes, April, *H. C. Taylor 7069* (STE, PRE);

Betty's Bay, March, *Bayliss 1178* (PRE); Buffelstalberg ridge, May, *Boucher 343* (STE); Rooi Els, May, *Compton 15700* (NBG); The Point, Pringle Bay, Sept., *Rourke 920* (NBG); Hangklip, flats near sea, Dec., *Barker 10365* (NBG); slopes at Pringle Bay, Voorberg, Sept., *Baker 1410* (BM); lower north-east foothills of Blesberg, near Cape Hangklip, July, *Rourke 1482* (NBG, PRE, STE, K, MO, S, M).

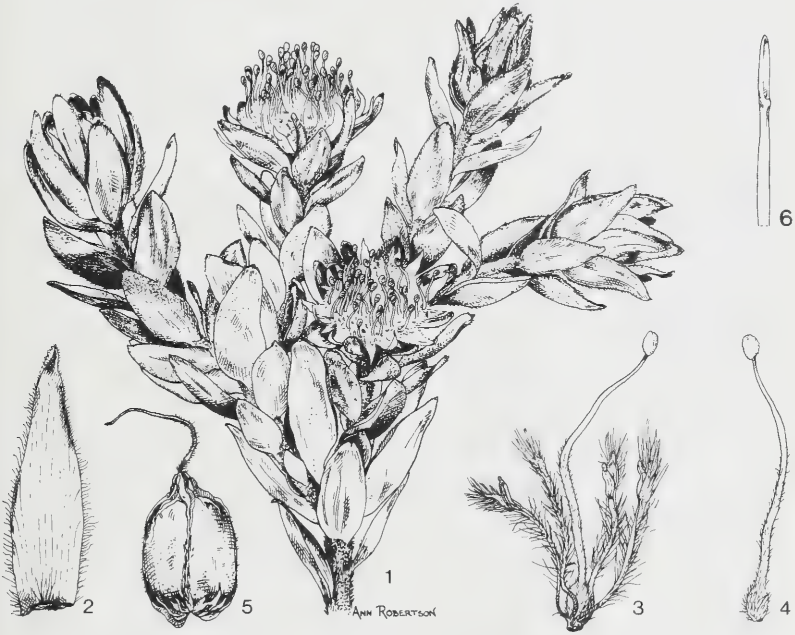

FIG. 8.
Diastella thymelaeoides (Berg.) Rourke ssp. *meridiana* Rourke; (1) flowering shoot, life-size; (2) involucral bract (inner surface) × 3; (3) open flower with pollen presenter loaded with pollen × 3; (4) gynoecium showing pollen presenter loaded with pollen × 3; (5) mature fruit × 3; (6) style apex and pollen presenter × 12 (from *Rourke* 1482).

(6) **Diastella proteoides** (L.) Druce in Rep. bot. Soc. Exch. Club. Br. Isl. 1931 **III:** 417 (1914).

Leucadendron proteoides L., Sp. Pl. ed. **I:** 91 (1753); Berg. in Kongl. Vetensk. Acad. Handl. **27:** 326 (1766); Berg., Descript. Plant. Cap.: 24 (1767). Lectotype: "Cap. b spei", without collector, No *116.16* in herb. Linn. (LINN!)

Protea purpurea L., Mant. Alt.: 195 (1771); Thunb., Diss. Prot.: 28,51 (1781); Thunb., Fl. Cap.: 129 (1823) – nom. Supfl. Type: As for *Leucadendron proteoides* L.

Mimetes purpurea (L.) R.Br. in Trans. Linn. Soc. Lond. **10:** 111 (1810); Roem. & Schult., Syst. Veg. **3:** 383 (1818); Meisn. in DC., Prodr. **14:** 266 (1856); var. *vulgaris* Meisn. in DC., Prodr. **14:** 266 (1856). Syntype: *Sieber 95* in herb. Meisn. (NY!); var. *linnaeana* Meisn. in DC., Prodr. **14:** 266 (1856). Syntype: Africa australis, *Burke s.n.* in herb. Meisn. (NY!); var. *brevifolia* Meisn. in DC. Prodr. **14:** 266 (1856). Type: Ex herb. Puerari in herb. Meisn. (NY!).

Mimetes homomalla Reichb.f. ex Meisn. in DC., Prodr. **14:** 266 (1856) – nom. nud.

Diastella ericaefolia Salisb. ex Knight in Knight, Cult. Prot.: 64 (1809); Phill. & Hutch. in Fl. Cap. **5:** 653 (1912); Adamson & Salter, Fl. of Cape Peninsula: 326 (1950) – nom supfl. Type: As for *Leucadendron proteoides* L.

A low, sprawling, much divaricate shrub, to 50 cm in height, forming diffuse mats up to 3 m in diam., with a single main trunk; branches horizontally sprawling. *Stems* 1–2 mm in diam., puberulous, with a short crisped indumentum interspersed with long, straight trichomes. *Leaves* linear, obtuse, semi-terete, upper surface slightly concave; 5–15 mm long, subsecund to ascending; glabrous or with a few spreading trichomes. *Inflorescences* 1 cm in diam., sessile, obconic becoming obconic-depressed on opening. *Involucre* 2–3 seriate. *Involucral bracts* lanceolate-acuminate, occasionally acute, 5–10 mm long, 1–2 mm wide, outer surface pubescent, inner surface sparsely sericeous proximally, margins ciliate. *Floral bracts* linear, 5 mm long, hyaline, sericeous. *Perianth* 7–10 mm long, straight, pink, claws sericeous; limbs lanceolate acute, glabrous; anthers sessile. *Style* straight, 10 mm long, tapering terminally, lower third minutely pubescent. *Pollen presenter* linear-acute 0,5 mm long. *Ovary* ovoid, 1 mm long, sericeous.

DIAGNOSTIC CHARACTERS

D. proteoides may be distinguished from related species by the sericeous pubescence on the outer surface of the involucral bracts and the presence of pubescence on the stems of the current year's growth.

Once abundant on the Cape Flats and in the sandveld to the north of Cape Town, this species formerly occurred along the eastern margin of the Cape Peninsula from Mowbray to Tokai; thence eastwards to Eerste River, Stellenbosch, Kraaifontein and Paarl and northwards as far as Mamre Road station in the north-east and Klein Springfontein in the north-west. At many of these localities it has been exterminated through agricultural or urban development. The distribution map (Fig. 9) therefore shows its former, rather than its present range.

D. proteoides grows on sandy flats in low fynbos, at elevations up to 150 m. This species flowers erratically throughout the year but principally from July to February.

SPECIMENS EXAMINED

CAPE—3318 (Cape Town): Flats 5 miles east of Mamre station (-BC), March, *Galpin 12655* (PRE, K); Klein Springfontein, north of Melkbos Strand (-CB), Sept., *Rourke 1094* (NBG); flats near Rondebosch (-CD), Aug., *Wolley Dod 617* (BOL, K, BM); Kenilworth, March, *Flanagan 2430* (PRE); sandy places near Cape Town, Aug., *Marloth 185* (PRE); Claremont flats, Jan., *Schlechter 182* (K,L); Cape Flats near Rondebosch, 7.7.1815, *Burchell 217* (K); Kenilworth Racecourse, Sept., *Barker 4105* (NBG); sandy flats between Katzenberg and Dassenberg (-DA), Oct., *Rourke 931* (NBG); on road to Atlantis, near Mamre, Sept., *Williams 2065* (NBG); Kalabas Kraal, Jan., *Axelson 374* (NBG); Paarl (-DB), Jan., *de Villiers s.n.* (NBG *104684*); high dry ground near Paarl Berg, Oct., Nov., *Niven 55* (PH); between Mosselbanks River and Berg River, Paarl, *Burchell 979* (K); Wolwefontein, south of Kraaifontein (-DC), March, *Oliver 3305* (PRE, STE); Kuils River, Aug., *Strey 461* (PRE); between Kraaifontein and

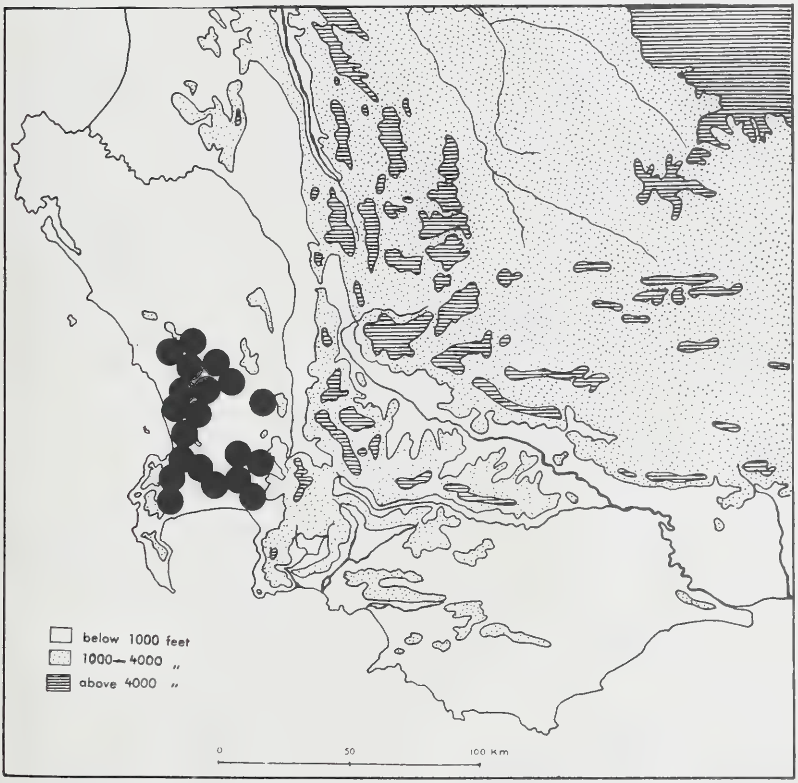

Fig. 9.
Distribution of *Diastella proteoides* (L.) Druce.

Bottelary hills, Feb., *Rourke 1025* (NBG); Brackenfell, Dec., *Compton 10113* (NBG); Joostenberg (-DD), Oct., *Esterhuysen 16039* (BOL); Stellenbosch, *Duthie 699* (BOL); Muldersvlei, Jan., *Pillans 10398* (BR); flats near Joostenberg, Oct., *Pillans 16039* (BOL).

—3418 (Simonstown): Wynberg (-AB), *R.C. Alexander Prior s.n.* (PRE); Bergvliet Farm, Oct., *W. F. Purcell s.n.* (SAM); low places near Constantia, Oct., 1801, *R. Brown s.n.* (K); Tokai flats, Oct., *Foley 17* (NBG); Cape Flats near Eerste River (-BB), Dec., *Bolus 2905* (SAM, BM).

(7) **Diastella buekii** (Gandoger) Rourke, comb. nov.

Mimetes buekii Gandoger in Bull. Soc. bot. Fr. **48:** (1901) – basionym. Type: Africa australis, *Drège 80226* in herb. Gandoger (LY!) – photo NBG.

Mimetes purpurea (L.) R.Br. var. *longifolia* Beuk ex Meisn. in DC., Prodr. **14:** 266 (1856). Type: "In arenosis circa Franschhoek" *Drège s.n.* in herb. Meisner (NY.!).

A low prostrate shrub with procumbent trailing stems, forming a dense mat 15 cm in height, up to 1 m in diam. *Stems* glabrous, flushed with red, tending to root at nodes. *Leaves* acicular, 1,0–2,5 cm long, with a thickened apical callous, semi-terete, upper surface occasionally slightly canaliculate; glabrous; ascending or occasionally subsecund to secund. *Inflorescences* borne on short branchlets; obovoid, 1–1,5 cm in diam., overtopped by the surrounding leaves, 15–20 flowered. *Involucral bracts* 2–3 seriate, lanceolate, acute to accuminate, 5–7 mm long, outer surface of outer bracts glabrous, margins ciliate; outer surface of inner bracts sparsely pubescent. *Floral bracts* linear subulate, 6–7 mm long, sericeous. *Perianth* pink, 8–10 mm long; claws straight, sericeous; limbs very narrowly lanceolate acute, glabrous; tube 0,5 mm long. *Style* filiform, to 12 mm, tapering terminally, puberulous above the ovary, the remainder glabrous. *Pollen presenter* 1 mm long, linear acute. *Ovary* ovoid, 1 mm long, puberulous.

DIAGNOSTIC CHARACTERS

The glabrous acicular leaves, 1–2,5 cm long, overtopping the inflorescence and the distinctly glabrous stems, readily distinguish *D. buekii* from *D. proteoides*. In addition, the outer surface of the outer whorl of involucral bracts (apart from the ciliate margins), is glabrous.

Salter and Garside made collections of this species in 1934. Since then, no further material has been deposited in local herbaria. These, as well as the other

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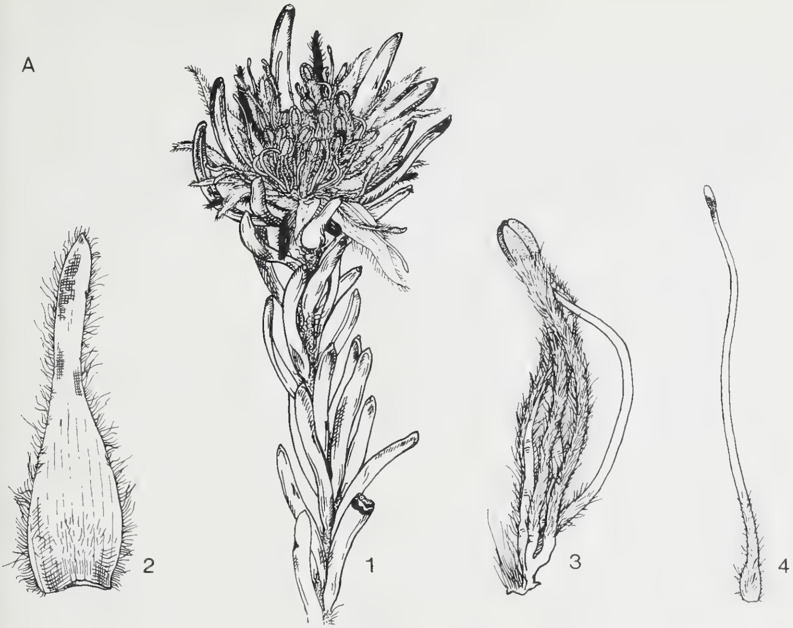
FIG. 10.

(A) *Diastella proteoides* (L.) Druce; (1) flowering shoot × 2,5; (2) involucral bract (inner surface) × 6; (3) flower at anthesis × 6; (4) gynoecium × 6 (from *Rourke* 1094).

(B) *Diastella buekii* (Gandoger) Rourke; (1) flowering shoot × 2,5; (2) involucral bract × 6; (3) flower at anthesis × 6; (4) gynoecium × 6 (from *Salter* 4731).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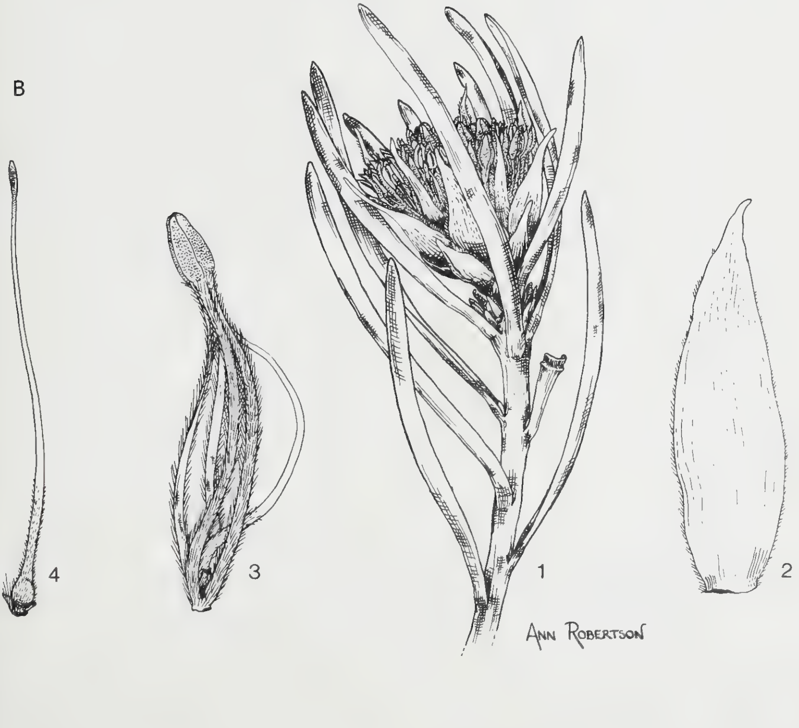
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Ann Robertson

collections made earlier this century, are all from roadsides or similarly fragile habitats. Despite several searches at sites where *D. buekii* had been recorded previously, no living plants have yet been traced. It would appear that *D. buekii* must have occurred on the floor of the upper Berg River valley, particularly in the vicinity of the junction of the Berg and Wemmers rivers. It apparently occurred in sandy situations at elevations ranging from 200–300 m. Flowering has been recorded as taking place from August to November.

As the entire area in which *D. buekii* is known to have occurred has now been developed for agricultural and residential purposes, the chances that this species has survived are relatively slim. Nevertheless, although I have not been able to trace any living populations of *D. buekii* it is just possible that a relict population still survives somewhere in the French Hoek valley.

SPECIMENS EXAMINED

CAPE—3318 (Cape Town): Groot Drakenstein (-DD), Nov., *F. A. Rogers 17910* (BOL, GRA).

—3319 (Worcester): On sandy wet soil at roadside, La Motte, between main road and Wemmershoek river (-CC), Aug., *Garside 4621* (K, SAM); slopes of

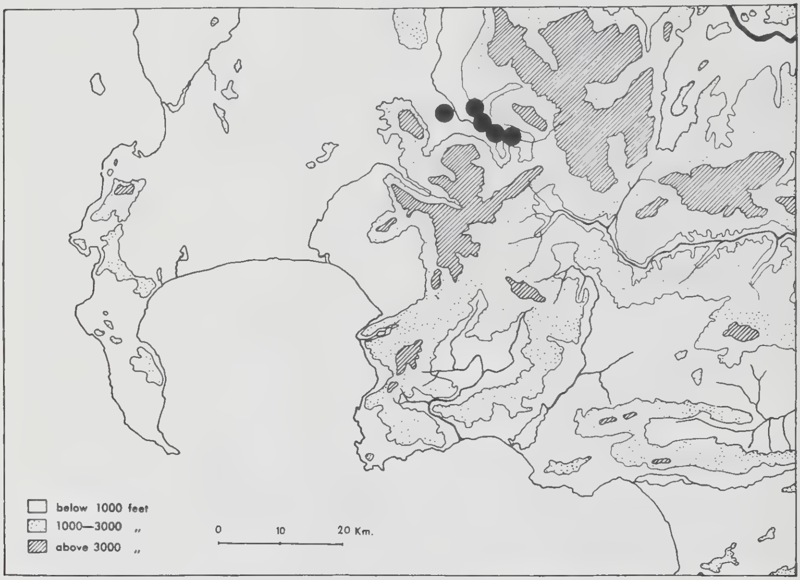

FIG. 11.
Distribution of *Diastella buekii* (Gandoger) Rourke.

Drakenstein, French Hoek, Oct., *Lamb 2708* (PRE); Wemmers Hoek, Aug., *Salter 4731* (K, GRA, BM, NBG, SAM, PRE); sandflats at French Hoek, 5.11.1828, *Drège 1490* (P, SAM); French Hoek, Nov., *Phillips 1271* (SAM); French Hoek, Nov., *Schlechter 9229* (K, L, GRA, PH).

Species Non Satis Cognitae

Diastella humifusa Salisb. ex Knight in Knight, Cult. Prot.: 64 (1809); Phill & Hutch in Fl. Cap. **5:** 654 (1912). Type: Not traced.

No type of *D. humifusa* has yet been traced. Moreover, Salisbury's description is so vague that it cannot be applied with certainty to any particular population of *Diastella*, although it most closely fits the species here enumerated as *D. buekii*. No clues can be gleaned from the vague information given concerning the type locality: "Mr J. Roxburgh discovered it in Hottentots Holland", according to Salisbury. However tempting it may be to adopt the name *D. humifusa* and apply it to what is here described as *D. buekii*, it is considered wisest to regard *D. humifusa* as imperfectly known until a type specimen comes to light. Despite a careful search in all the major European herbaria known to contain Roxburgh's collections, no type has been unearthed during the past few years and, at this stage, it seems unlikely that it ever will.

Hybrids

Although extensive field work has been undertaken on *Diastella* over many years, the author has never encountered a case of hybridization between species. The only example of hybridization yet detected in nature is a putative bigeneric hybrid between *Leucospermum oleifolium* and *Diastella thymelaeoides*. A single specimen was found growing at Sunny Seas, Betty's Bay, between the two presumed parent species. No other possible parent species were observed in the area. Cuttings of this plant were rooted in a mist propagation unit at the National Botanic Gardens, Kirstenbosch, where they have been cultivated for several years. The hybrid is quite sterile but is exceptionally vigorous. It flowers continuously for almost six months, making a fine horticultural subject. At this stage it can only be suggested that this plant is a putative bigeneric hybrid on the basis of its gross morphology. A detailed cytological study will have to be undertaken in due course in order to confirm this supposition.

Leucospermum oleifolium × Diastella thymelaeoides

CAPE—3418 (Simonstown): Sunny Seas, Betty's Bay (-BD), a single plant seen, 7.1.1965, *Rourke 245* (NBG).

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